REMARKS

A minor typographical error has been noted in paragraph 2 on page 2 of the Office Action wherein it was stated that claims 38-41, 51, 68-71 are withdrawn etc. Claim 71 was not in the non-elected group and in paragraph 7 on page 9 of the Office Action it was indicated that claim 71 was directed to allowable subject matter.

In the Final Rejection claims 36, 37, 42-46, 48-50, 52-55 and 62-63 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilt et al. (US 5,737,122) in view of Roustaei (US 5,532,467). Claims 47, 56-61 and 64-67 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Wilt in view of Roustaei and further in view of Wang et al. (US 5,521,366). Claims 71-78 were indicated as being directed to allowable subject matter.

Claims 36 and 37 have been amended to more clearly define the present invention. Reconsideration and allowance of the application are respectfully requested in view of the following remarks.

The problem to be solved is that of enabling proper reading of optical codes placed within a broad range of distances. This problem is solved, as recited in amended claim 36, by providing "a first array of light sources and at least a second array of light sources, wherein the light sources of said first and second array of light sources are selectively activated in order to define a first illumination configuration, corresponding to a first selection of light sources, for illuminating an optical code placed within a first distance range, and at least a second illumination configuration, different from the first one and corresponding to a second selection of

light sources different from the first one, for illuminating an optical code placed within at least a second distance range, said second distance range being different from said first distance range".

Claim 37 has been amended consistently with claim 36.

Amended claims 36 and 37 differ from pending claims 36 and 37 in that they now clearly recite that the light sources are selectively activated so that each illumination configuration corresponds to a respective selection of the light sources, i.e. to a respective group of light sources which are activated. Therefore, it is now clear that the inventive idea at the basis of the Applicant's invention is to select the light sources to be activated depending on the distance of the code to be read and to change the selection of the light sources when the distance changes. For example, when the code to be read is at a first distance a first group of light sources is activated and when the code to be read is at a second distance a second group of light sources is activated, the second group being different from the first group, in the second group being activated at least one light not activated in the first group, or vice versa (see for example the first two configurations of table 1 on page 13 of the specification as filed).

Wilt is directed to an apparatus for recognizing different type of indicia (i.e. soft marks, hard marks in bright field and hard marks in dark field) on a substrate placed at a predetermined and fixed distance from the apparatus. The apparatus consists of an illumination system and a camera. The distance between the apparatus and the substrate is predetermined and fixed. This is clearly derivable from column 6, lines 24 to 45, wherein it is clearly recited that:

- the size of the field of view of the camera is a function of the optical magnification of the selected lens and the physical size of the CCD and of other optical elements of the camera (see lines 24 to 36);

- a specific field of view is appropriate for viewing marks having prefixed dimensions (see lines 36-37), i.e. for marks placed at a prefixed distance;

- those familiar with cameras and lenses can select the right combination to provide the magnification best suited for a particular application (see lines 43-45).

This means that the field of view of the camera is fixed once the lens, CCD and other optical elements of the camera are selected, this field of view being appropriate for recognizing marks on a substrate placed at a prefixed distance.

Therefore, it is clear that Wilt is directed to the recognition of marks placed at a predetermined and fixed distance. The object of Wilt is thus far way from that of the Applicant's invention, which is of enabling proper reading of optical codes placed within a broad range of distances.

The Examiner acknowledged that Wilt does not teach the first and the second illuminating configurations for illuminating an optical code placed within a first distance range and a second distance range different from the first one (see page 4, lines 1 to 3 of the Office Action).

Wilt further does not teach selectively activating the light sources of the first and second array of light sources in order to define different illumination configurations, corresponding to respective different selections of the light sources, for illuminating optical codes placed at

respective different distance ranges. Wilt's only teaching is that, in order to correctly recognize either soft and hard marks place at a predetermined and fixed distance, different illumination sources has to be used, wherein some are particularly adapted for reading soft marks and other ones are particularly adapted for reading hard marks. However, this teaching does not lead to the Applicant's invention as recited in amended claims 36 and 37.

One skilled in the art would have realized that Wilt's apparatus was not capable of recognizing marks placed at different distances, for example at a distance different from that prefixed and illustrated in figure 5, due to the particular arrangement of the optical elements therein. Indeed, looking at figure 5 he would have realized that if the distance between the substrate 110 and the opening 98 increases, the light coming from the mirror 126 and impinging on the substrate 110 would have been reflected out of the cone of view of mirror 128, and thus this light would not have reached the CCD.

Further, Wilt does not teach to incorporate, into the same casing, the illuminating means, the detection means and the objective lens, as claimed by the Applicant. Indeed, referring to figure 5, the illuminating means are incorporated into the enclosure 112, whereas the detection means and the objective lens are incorporated into the video camera 102.

In view of the above, the invention as defined in amended claims 36 and 37 is novel and non obvious over Wilt, since Wilt is silent about either the problem and the solution of the Applicant's invention.

Roustaei is directed to a scanning head for reading codes at variable distances. Roustaei suggests to use a plurality of LEDs oriented at different angles so that a wide and uniformly illuminated fan of light is created.

In order to minimize power consumption during scans, Roustaei suggest two different solutions.

In a first embodiment, all the LEDs, possibly grouped in trios, are gradually and sequentially activated in response to a clocked signal (see column 6, lines 16 to 60). According to this embodiment, all the light sources are subsequently activated with a predetermined order, irrespective of the distance of the code to be read.

In an alternate embodiment, the voltage of all the LEDs is regulated in response to a signal level depending on the distance of the code to be read (see column 6, lines 5 to 15 and column 6, line 61 to column 7, line 15). According to this embodiment, all the light sources are activated with a voltage value which changes when the distance of the code to be read changes. In particular, when the code is placed at a first distance all the light sources are activated with a first voltage value and when the code is placed at a second distance all the light sources are activated with a second voltage value, different from the first one.

Therefore, Roustaei teaches to activate all the light sources and to regulate the voltage of the light sources depending from the distance of the code to be read, whereas the Applicant's invention teaches to selectively activate the light sources in order to activate different groups of light sources depending on the distance of the code to be read. In particular, Roustaei teaches to activate all the light sources with a predetermined voltage value and to vary the voltage value

when the distance of the code to be read changes, whereas the Applicant's invention teaches to select a first group of light sources to be activated and to change the group of the light sources to be activated when the distance of the code to be read changes.

Since Roustaei teaches to activate all the light sources, whereas the Applicant's invention teaches to select the light sources to be activated, Roustaei teaches away, for the Applicant's invention as now claimed.

In view of the above, one skilled in the art would have not had from Roustaei any teaching or suggestion for reaching the invention as recited in amended claims 36 and 37. On the contrary, he would have been taught away from the Applicant's invention as claimed.

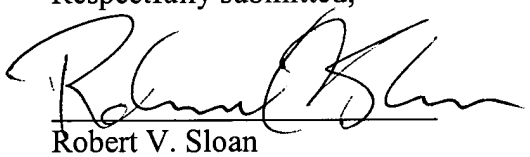
In addition, one skilled in the art would have not combined the teaching of Wilt with that of Roustaei because they are directed to totally different objects. Wilt is directed to recognize marks placed at a predetermined and fixed distance and could not work if used for recognizing marks at variable distances, whereas Roustaei is directed to read code placed at different distances. However, one skilled in the art would not have reached the Applicant's invention as claimed since Wilt is silent about the first and second illuminating configurations for illuminating an optical code placed within a first distance range and a second distance range different range different from the first one (as recognized by the Examiner), whereas Roustaei is silent about the selection of the light sources in order to define said first and second illuminating configurations.

In view of the fact that the claims rejected as being unpatentable over Wilt in view of Roustaei and Wang are all dependent directly or indirectly from claims 36 and 37 it is not deemed necessary to argue this rejection separately.

In view of the foregoing amendments and arguments it is respectfully submitted that the claims of the present application would not be anticipated by or obvious in view of the references relied upon taken either alone or in combination with each other. Therefore it is respectfully requested that claims 36, 37, 42-50, 52-67 and 71-78 be allowed and the application passed to issue forthwith.

If for any reason the Examiner is unable to allow the application on the next Office Action and feels that an interview would be helpful to resolve any remaining issue, the Examiner is respectfully requested to contact the undersigned attorney for the purpose of arranging such an interview.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

--36. (Amended) An apparatus for reading optical codes placed at variable distances, comprising:

a casing;

a reading window open into the casing;

an illuminating means (3), housed within the casing, and arranged to act on an optical code to be read through the reading window;

a detection means (4), housed within the casing and responsive to light scattered from the illuminated optical code into the casing through the reading window, wherein the detection means (4) comprises a plurality of light-sensitive elements (5a) capable of converting said light into electric signals representing the light image;

an objective lens (9) having an optical axis (Z), the objective lens being housed within the casing between the reading window and the detection means (4), and being located to pick up light scattered from the illuminated optical code and project the picked-up light onto the detection means (4);

wherein the illuminating means (3) comprises a first array of light sources (6) and at least a second array of light sources (7), said light sources of said first and second array of light sources being selectively activated in order to define a first illumination configuration,

corresponding to a first selection of light sources, for illuminating an optical code placed within a first distance range and at least a second illumination configuration, different from the first ~~one~~illumination configuration and corresponding to a second selection of light sources different from the first selection of light sources, for illuminating an optical code placed within at least a second distance range, said second distance range being different from said first distance range.

37. (Amended) A method of reading optical codes placed at variable distance from an apparatus comprising a means of illuminating an optical code to be read and means of detecting light scattered from the illuminated optical code, which method comprises the following steps:

a) illuminating an optical code to be read so as to define a read scan;

b) picking up the light scattered from the illuminated optical code on the detection means;

c) converting the picked-up light to electric signals representing the light image;

wherein step a) of illuminating the optical code in turn comprises the following steps:

a1) acquiring an operational parameter indicating specific conditions of the reading operation; and

a2) selectively activating, according to the acquired operational parameter, at least one light source of a first array of light sources and/or at least one light source of a second array of light sources so as to define a first illumination configuration, corresponding to a first selection of light sources, for illuminating an optical code placed within a first distance

range and at least a second illumination configuration, different from the first ~~one~~illumination configuration and corresponding to a second selection of light sources different from the first selection of light sources, for illuminating an optical code placed within at least a second distance range, said second distance range being different from said first distance range.--